



Complete Guide to Non-Metallic Washers



Washers play a critical role in prolonging component lifespan by ensuring proper load distribution and sealing. They are used in many types of equipment, including everything from home appliances to spacecraft. Shaped like a flat disk with a hole punched through the center, they are positioned in between two adjoining surfaces to reduce vibration, provide greater stability, and distribute pressure for bolts, screws, and other fasteners.

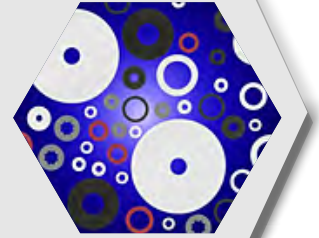
Virtually any application that involves the attachment of two surfaces benefits from using a washer. Non-metallic washers offer a range of benefits, including improved weight, cost, torque, and sealing properties, as well as excellent resistance to weather, moisture, vibration, and extreme temperatures. At New Process Fibre, we have over a century of experience perfecting non-metallic washer design and manufacturing. Our products provide a cost-effective and highly reliable alternative to metallic washers in nearly any application.

Key Features & Types of Non-Metallic Washers

Non-metallic washers from New Process Fibre are produced in a variety of durable materials, each offering its own performance advantages.

Nylon

There are several varieties of Nylon, each displaying the same non-toxic, anti-corrosive properties. Nylon materials are lightweight, resistant to friction and wear, and feature a more elastic construction than their metal counterparts. In addition, they provide excellent noise-absorbing and insulation properties and are fireproof. Compared to metal washers, all types of Nylon offer significant cost savings. Nylon is the preferred material for many aerospace, electrical, industrial, and marine applications.

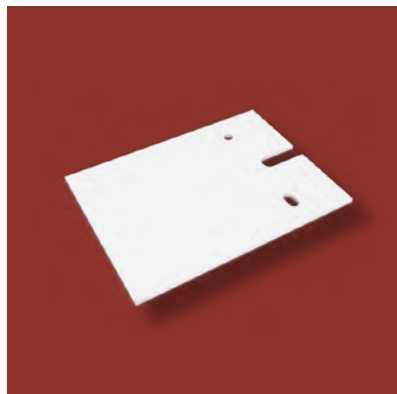


Let's take a closer look at the properties each type of Nylon offers:

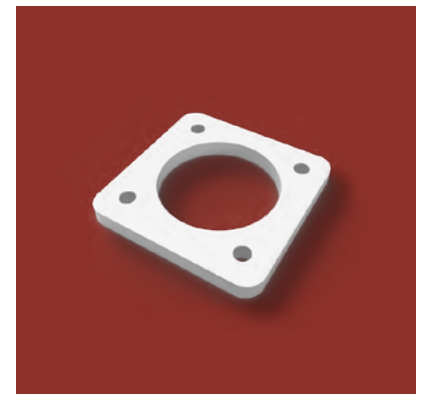
- ◇ **Nylon 6:** Displays high tensile and impact strength while also being resistant to abrasion. Nylon 6 is elastic, easy to machine, and features a high moisture absorption capacity. This material can be mixed with carbon fibers or glass to further improve its performance. It is widely used throughout food processing equipment applications due to its nontoxic nature.
- ◇ **Nylon 6/6:** Features higher tensile strength and stiffness than Nylon 6, as well as a higher melting point and greater dimensional stability. It is highly resistant to hydrocarbons, features a high lubricity, and offers exceptional ductility, heat resistance, and strength. It is a popular choice for household appliances.
- ◇ **Nylon MDS:** A version of Nylon 6/6 that has MDS particles added to it for improved load-bearing capacity. This material features a self-lubrication level similar to PTFE, which translates to an extended service life and exceptional wear resistance. Nylon MDS is superior when it comes to durability and toughness. For this reason, it is frequently used in applications that involve exposure to high mechanical stress. It is an excellent choice for machinery components.



Nylon 6



Nylon 6/6

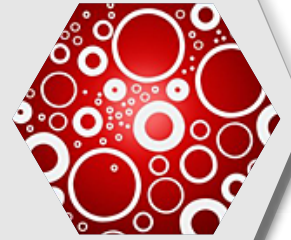


Nylon MDS



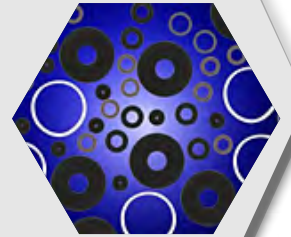
Teflon™ / PTFE (Polytetrafluoroethylene)

PTFE, commonly known by its trademarked name Teflon, is a highly chemically resistant material. As a result, it is a common choice for applications that involve corrosive chemicals. PTFE washers are able to maintain their shape and dimensional stability during exposure to high voltages and temperatures up to 600 °F. PTFE is also known for its low coefficient of friction, even under adverse conditions. It is widely used in applications that demand high performance, such as those found in aerospace, automotive, and industrial environments.



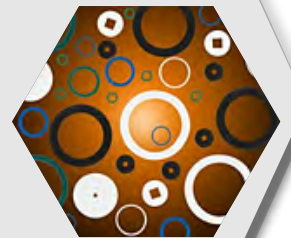
Delrin® / Polyoxymethylene

Delrin is an exceptionally durable plastic material. When used to create washers, it delivers exceptional temperature resistance, chemical resistance, and high tensile strength. In addition, Delrin features high dimensional stability and exhibits low creep under temperature fluctuations. It is a popular choice for applications that involve extreme operating conditions, such as aerospace, automotive, construction, and various mechanical applications.



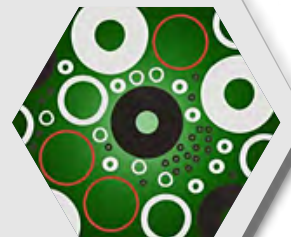
PE (Polyethylene)

There are two forms of polyethylene: low-density polyethylene (LDPE) and high-density polyethylene (HDPE). Both forms are affordable to manufacture in large quantities and are suitable for manufacturing using stamping processes. LDPE washers are highly flexible and elastic yet exceptionally tough, with a high degree of dimensional stability. HDPE washers are more stiff and less flexible yet retain a high degree of tensile strength.



Acetal Copolymer

A stiff, synthetic material, acetal copolymer displays excellent strength, durability, and dimensional stability. These characteristics allow it to be used in a wide variety of demanding environments without deforming.





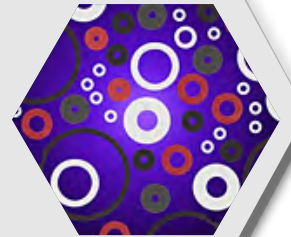
Mylar

Mylar is highly resistant to shrinkage and does not absorb high amounts of water. What little water it can absorb does not change its shape. For these reasons, it is a popular material for applications that involve submersion or large amounts of water.



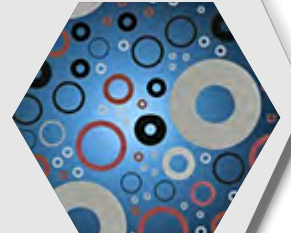
Polypropylene (Homo & Co-polymers)

Polypropylene combines the beneficial characteristics of homopolymer resin with copolymer resin, resulting in a material with enhanced abrasion resistance and mechanical strength. Polypropylene washers are lightweight, impact and fatigue-resistant, and deliver superior performance in various demanding applications.



Vulcanized Fibre

Vulcanized fibre washers provide an ideal strength-to-weight ratio, as well as high flexibility and good dielectric properties. This material is highly versatile, allowing it to be formed into numerous custom shapes to suit nearly any application. Its high mechanical strength, excellent impact and abrasion resistance, and superior electrical properties make vulcanized fibre washers a good choice for automotive components, appliance insulation, plumbing and marine components, and more.



Additional materials to consider include:

- ◆ Nomex
- ◆ Non-Asbestos Compressed Sheet
- ◆ Lexan/Polycarbonate
- ◆ PVC
- ◆ Neoprene
- ◆ G-10 FR4 Nema Grade Material
- ◆ Pressboard
- ◆ Chipboard
- ◆ Garlock®
- ◆ Duroid®
- ◆ Canvas/Phenolic (Nema C, CE, CYB)
- ◆ Kapton®/Polyimide Film
- ◆ ABS
- ◆ ThermaSeal® (Klinger®)



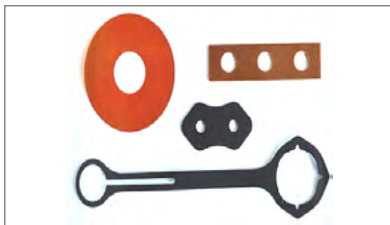
Metallic vs. Non-Metallic Washers

Non-metallic washers are able to provide the same function as metallic options, but with several additional advantages. For example, non-metallic varieties offer better pressure distribution. They spread the fasteners' stress across a wider area, better protecting surface material from damage during installation and use. We offer a variety of standard colors or we can custom color match to your specifications.

In addition, non-metallic washers mitigate the risks posed by impacts, temperature fluctuations, vibrations, and many other challenging environmental effects. They are less likely to loosen over time and offer a more streamlined border between surfaces. Non-metallic washers are frequently available in many specialized shapes that enhance their versatility. For example, C washers feature an opening on one side for installation in hard-to-reach areas without the need to disassemble fixture hardware. D washers are another special shape and are ideal for limited space areas where circular washers do not fit.

Considerations

Non-metallic washers provide reliable performance throughout a wide range of industry-diverse applications. The following are some industry-specific considerations for non-metallic washer usage.



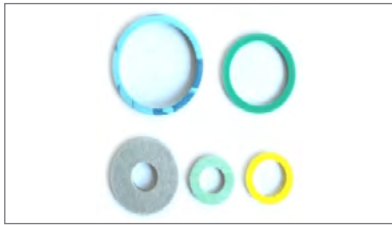
Medical Devices & Equipment

Nylon materials are a popular choice for medical applications due to their corrosion resistance, temperature resistance, and tensile strength. They are frequently used in face shields, medical tables, and respirator components.

Automotive Systems

Unlike metal washers, a non-metal washer, like Teflon, easily withstands moisture, corrosion, and chemical exposure. They will not rust or lose structural integrity. This makes them ideal for a wide range of automotive uses, including engines, brakes, and transmission systems, as well as automotive body parts. They are resistant to road salts, environmental moisture, and car fluids.



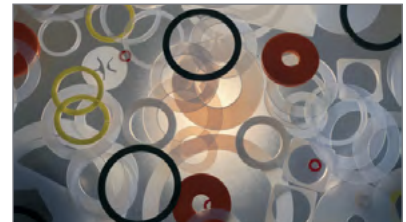


Plumbing & Marine Equipment

Hardware for plumbing and marine equipment is frequently exposed to saltwater, moisture, and corrosive fluids that metal washers cannot endure. Non-metallic washers provide a corrosion- and abrasion-resistant option that's much more dependable. PTFE washers will retain their form and integrity under high temperatures and are a common choice for industrial plumbing and marine applications.

Industrial & Manufacturing

HDPE washers provide the superior strength and performance capabilities needed to withstand heavy-duty industrial environments. Their extreme durability and resistance to crushing have led them to be used throughout many types of mechanical systems.



Oil, Gas, and Chemical Processing

LDPE washers feature toughness and elasticity that are ideal for sealing within high-performance applications. LDPE provides the flexible corrosion resistance that is vital to oil, chemical, and gas processing environments.

Learn more about our non-metallic washer solutions for various industries [here](#).



Our Capabilities

New Process Fibre offers a comprehensive variety of non-metallic washer varieties, including plain, specialty, and self-retaining washers.

Plain Washers

Our plain, flat washers distribute force and protect the objects that are being fastened. We create plain washers in a diverse range of materials, inner dimensions, outer dimensions, and thicknesses, and also take on custom orders according to virtually any specification your application requires. The common varieties of plain washers we create include:



Flat washers



Fender washers



Shoulder washers



Torque washers

Self-Retaining Washers

New Process Fibre specializes in self-retaining washers, which are stamped with protrusions from the inside diameter for better screw grip. These tabs are usually stamped in the shape of triangles or stars, but we can accommodate other designs as well, including hex IDs and slit IDs that offer a bit of give.

Specialty Shaped Washers

We offer both C and D washers:

C washers:

Shaped like the letter C, this variety features an opening that allows it to latch easily onto equipment. This shape is valued for its ability to be used within hard-to-reach spaces without having to take equipment apart.

D washers:

Shaped like the letter D, these washers serve as a substitute for flat washers in limited-space environments.

Non-Metallic Washers from New Process Fibre

Non-metallic washers meet the demands of some of the world's most challenging applications. These durable, corrosion-resistant components are used throughout virtually every industry. At New Process Fibre, we bring decades of experience to washer fabrication, offering high-quality products that adhere to tight tolerances. To get your next project started, [contact our team](#) today.



About Us

Since 1927, New Process Fibre Company has built a strong reputation on low cost, high volume and quality service to produce precision nonmetallic stamped products for our highly valued customers. We manufacture non-metallic stamped products in all shapes from a large array of materials for the following industries including, but not limited to: Aerospace/Military, Automotive, Consumer Goods, Electronic, Electrical Insulation, Fastener, Furniture, Farm and Garden Equipment, Marine and Plumbing. Our extensive in-house capabilities of stamping, tool making, thermoplastic sheet extrusion and slitting gives us the ability to better manage our production cycle time, so what we make for you arrives on your dock when you need it to meet your production schedules.

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Address: 12655 N. First Street | P.O. Box 2009 | Greenwood, DE 19950 USA

Toll Free: 800-497-4520 | **Phone:** 302-349-4535 | **Website:** www.newprocess.com